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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/402,322 | 02/02/2000 | WOLFGANG DULTZ | 2345/91 | 5796 |
| 26646 | 7590 | 04/06/2004 | EXAMINER | |
| KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004 | | | STULBERGER, CAS P | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2132 | |

DATE MAILED: 04/06/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/402,322

Applicant(s)

DULTZ ET AL.

Examiner

Cas Stulberger

Art Unit

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. This action is responsive to communications: application, filed 12/22/99; request for reconsideration filed 01/02/2004.
2. Claims 11-21 are pending in the case. Claims 11, and 15 are independent claims.

Response to Arguments

3. Applicant's arguments, of the Request for Reconsideration, filed 01/02/2004, with respect to the rejection(s) of claim(s) 11-21 under 35 U.S.C. 102e and 35 U.S.C. 103a have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over as applied to U.S. Patent No. 5,999,285 to Brandt et al in view of U.S. Patent No. 5,307,410 to Bennett.
3. Brandt discloses a quantum key distribution method that employs non-orthogonal quantum states to distribute a random bit sequence between two users for use as a provably secure key for encryption and authentication. Brandt also discloses two beam splitters and three

photodectors (Brandt: Abstract, Figure 1). This meets the limitations of “emitting photons, splitting the photons, and detecting the photons by a first, second, and third beam splitters, the second detector disposed in a second downstream path of the first beam splitter and a third detector being disposed in a fourth downstream path of the second beam splitter.” For the purpose of secure key generation in quantum cryptography, one can employ a train of single photons having two possible equally likely nonorthogonal polarization states, which encode 0 and 1, respectively, to securely communicate a random bit sequence between a sender and a receiver (Brandt: column 2, lines 4-10). Brandt however does not disclose “a third beam splitter” or “generating a random number when the photons or photon swarms detected at the first, second, and third detectors together correspond to a predefined photon scheme.”

Bennett discloses a random number generator for generating random numbers, a phase modulation coupled to the first source of coherent light pulses and one or more beam splitter (Bennett: column 2, lines 62-67). This meets the limitation of “a third beam splitter.” Bennett also discloses that the phase of each dim light pulse is chosen randomly from a plurality of predetermined values in response to the random number (Bennett: column 1, lines 67-69; column 2, lines 1-16). This meets the limitation of “generating a random number when the photons or photon swarms detected at the first, second, and third detectors together correspond to a predefined photon scheme.”

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the method of using two beam splitters and three detectors as disclosed by Brandt with the method of having a third beam splitter as disclosed by Bennett in

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order to achieve provable security that their messages are unintelligible to an eavesdropper (Bennett: column 1, lines 24-25).

4. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over as applied to U.S. Patent No. 5,999,285 to Brandt et al claims 11-13, and 15 above, and further in view of U.S. Patent No. 5,966,224 to Hughes et al.

Brandt however does not disclose using an attenuated laser as the light source or a trigger detector. Hughes discloses using a trigger detector (Hughes: column 6, line 32). Hughes also discloses using a laser that outputs single pulses that are split into preceding bright pulses and delayed attenuated pulses and polarized (Hughes: Abstract, second sentence). This meets the limitation of “wherein the photon source includes an attenuated laser; the first detector includes a trigger detector.”

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the method of key distribution as disclosed by Brandt with the method of using an attenuated laser and trigger detectors as disclosed by Hughes in order to avoid attenuation and beam wander because of atmosphere turbulence (Hughes: column 6, lines 28-29).

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over as applied to U.S. Patent No. 5,999,285 to Brandt et al claims 11-13, and 15 above, and further in view of U.S. Patent No. 3,575,669 to Haeff et al.

Brandt however does not disclose using a thermal light source. Haeff discloses a thermal light source spontaneously emits lights as photons (Haeff: column 1, lines 4-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made the method of key distribution as disclosed by Brandt with the method of using a thermal light source as disclosed by Haeff in order to release energy as photons substantially without influence by and independently of photons emitted by any other atom or molecule (Haeff: column 1, lines 8-10).

6. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over as applied to U.S. Patent No. 5,999,285 to Brandt et al claims 11-13, and 15 above, and further in view of U.S. Patent No. 5,323,010 to Gratton et al.

Brandt however does not disclose a spectral lamp. Gratton discloses that the light source may be an arc lamp, a spectral lamp, an LED, a continuous wave laser, a diode laser, or the like with the light beam being pulsed in a variety of possible ways. (Gratton: column 11, lines 24-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made the method of key distribution as disclosed by Brandt with the method of using a spectral lamp, and LED as disclosed by Gratton in order to accurately determine phase and modulation at high frequencies (Gratton: column 3, lines 6-7).

Conclusion

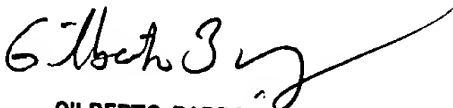
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cas Stulberger whose telephone number is (703) 305-8034. The examiner can normally be reached on Monday - Friday, 9:00A.M. - 5:00P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on (703) 305-1830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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